

What is claimed is:

1. A method for micromachining a structure, said method comprising selectively removing at least a portion of the structure by chemical mechanical polishing, wherein the structure thus formed is at least partially non-planar.

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2. The method of claim 1 wherein the structure is formed on an essentially planar substrate.

3. The method of claim 1 wherein said chemical mechanical polishing step is  
10 conducted using a chemical mechanical polishing apparatus that includes a polishing pad.

4. The method of claim 3 wherein said removal is by a combination of chemical etch and mechanical polishing.

15 5. The method of claim 4 wherein said mechanical polishing is controlled by varying at least one characteristic of the polishing pad.

6. The method of claim 5 wherein said characteristic of the polishing pad is stiffness.

20 7. The method of claim 6 wherein said stiffness is manipulated by downforce on the pad, rotational velocity of the pad, acceleration velocity of the pad, local curvature of the pad, or combinations thereof.

8. The method of claim 1 wherein a concave structure is formed.

9. The method of claim 1 wherein a convex structure is formed.

5 10. The method of claim 1 wherein a rounded structure is formed.

11. The method of claim 7 wherein local curvature on the pad is provided by pre-shaped asperities.

10 12. The method of claim 7 wherein local curvature on the pad is provided by bumps under the pad.

13. The method of claim 1 wherein the structure includes a highest point and a lowest point, and wherein height differential between the highest point and the lowest point is  
15 0.5 microns or greater.

14. The method of claim 1 wherein the structure includes a highest point and a lowest point, and wherein height differential between the highest point and the lowest point is 1 micron or greater.

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15. The method of claim 1 wherein the structure includes a highest point and a lowest point, and wherein height differential between the highest point and the lowest point is 2 microns or greater.

16. A partially non-planar structure fabricated by the method of claim 1.

17. A microlens array fabricated by the method of claim 1.

5 18. An optical fiber array connector fabricated by the method of claim 1.